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ABSTRACT

Several intermediate performance objectives and corresponding criterion measures are listed for each of 25 terminal objectives for a basic appliance repair course. The materials were developed for a 36-week course (2 hours daily) designed to enable the student to be well-grounded in the fundamentals of electricity as well as applied electricity. This first year course covers safety, occupational opportunities, hand tools, math, basic and applied electricity and installation, repair, and troubleshooting of electrical appliances. The titles of the 25 terminal objectives sections are Orientation, Hand Tools, Basic Math, Electron Theory, Basic Electricity, Electrical Current Movement, Electric Circuitry, Meters, Electric Motors, Electric Motors (Three Phase), Relays and Capacitors, Circuit Protection Devices, Water Heaters, Electric Ranges, Dishwashers, Dishwasher Troubleshooting, Automatic Washers, Automatic Washer Timers, Automatic Washer (Drive System), Automatic Washer (Water Fill and Pump Cycle), Automatic Washer (Transmission), Troubleshooting (Automatic Washer), Dryers, Dryers (Electrical Components), and Troubleshooting--Laundry Equipment. (This manual and 54 others were developed for various secondary level vocational courses using the System Approach for Education (SAFE) guidelines.) (HD)

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appliance services

BASIC COURSE

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CE 010 970

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APPLIANCE REPAIR-BASIC

ACCREDITATION NO. 9023

LENGTH OF COURSE: 36 WEEKS

TIME BLOCK: 2 HOURS DAILY

COURSE DESCRIPTION

Appliance Servicemen must be well grounded in the fundamentals of electricity as well as applied electricity. Actual practice in repair and trouble diagnosis comes after these fundamentals are learned. The first year course consists of Safety, Occupational Opportunities, Hand Tools, Math, Basic and Applied Electricity and Installation, Repair, and Troubleshooting of Electrical Appliances.

9023 - APPLIANCE REPAIR - BASIC

Syllabus Of Terminal Performance Objectives

1.0 Orientation
2.0 Hand Tools
3.0 Basic Math
4.0 Electron Theory
5.0 Basic Electricity
6.0 Electrical Current Movement
7.0 Electric Circuitry
8.0 Meters
9.0 Electric Motors
10.0 Electric Motors (Three Phase)
11.0 Relays and Capacitors
12.0 Circuit Protection Devices
13.0 Water Heaters
14.0 Electric Ranges
15.0 Dishwashers
16.0 Dishwasher Troubleshooting
17.0 Automatic Washers
18.0 Automatic Washer Timers
19.0 Automatic Washer (Drive System)
20.0 Automatic Washer (Water Fill and Pump Cycle)
21.0 Automatic Washer (Transmission)
22.0 Troubleshooting (Automatic Washer)
23.0 Dryers
24.0 Dryers (Electrical Components)
25.0 Troubleshooting - Laundry Equipment

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 1.0 — ORIENTATION

The student will demonstrate his familiarity with career opportunities, student organizations and shop safety practices by answering correctly 80% of the questions on a teacher prepared test.

No.	Intermediate Performance Objectives	No.	Criterion Measures
1.1	Given a list of job titles the student will select with 100% accuracy the titles related to this field.	1.1	Circle those areas related to this field: 1. Washer Mechanic 2. Parts man 3. Service Manager 4. Janitor 5. Truck Driver 6. Installation Man
1.2	The student will identify orally or in writing at least 5 safety regulations.	1.2	Identify 5 safety regulations
1.3	The student will with 80% accuracy answer questions about student organizations available to him.	1.3	1. Name one club designed especially for industrial education students. 2. What does VICA mean? 3. Who can belong to VICA? 4. What benefits are derived from belonging to VICA?

ACCREDITATION NUMBER 4023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 2.0

HAND TOOLS

After completion of instruction on the care and proper use of basic hand tools the student will with 90% accuracy identify 10 selected hand tools and demonstrate their proper use.

No.	Intermediate Performance Objectives	No.	Criterion Measures
2.1	The student will with 100% accuracy name the types of screw-drivers.	2.1	Name the different types of screw-drivers.
2.2	The student will with 100% accuracy name the types of hammers and demonstrate their proper use.	2.2	Name the different types of hammers and select the proper hammer for cutting a gasket.
2.3	The student will with 100% accuracy name 3 types of pliers and demonstrate their proper use.	2.3	Name 3 types of pliers and demonstrate their proper use.
2.4	The student will with 100% accuracy identify 4 types of wrenches and describe their proper usage.	2.4	Identify 4 types of wrenches and describe their proper use.
2.5	The student will with 100% accuracy name the types of saws and demonstrate the proper use of one of them.	2.5	Name the types of saws and demonstrate the proper use of one.
2.6	The student will with 90% accuracy identify 3 classes of chisels, punches and drift pins.	2.6	Identify a chisel, drift pin, punch.
2.7	The student will with 90% accuracy select the proper hand tools normally associated with electrical work.	2.7	Select the proper hand tools normally associated with electrical work.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 3.0

BASIC MATH

Upon completion of the math review unit 90% of the students will achieve 70% proficiency on the attached test.

No.	Intermediate Performance Objectives	No.	Criterion Measures
3.1	Given problems involving the four fundamentals operations in math the student will solve 70% correctly.	3.1	Multiply 432 by 103. Multiply 316 by 214. Multiply 39 by 43. Divide 10836 by 18. Divide 1058 by 23.
3.2	Given 5 problems involving decimal fractions the student will solve 4 correctly.	3.2	Add .031 to 1.2. Subtract 2.061 from 2.5. Multiply 1.08 by .9. Divide 2.36 by .2. Divide .04 by .005.
3.3	Given 5 problems involving whole fractions the student will solve 4 correctly.	3.3	Add ½ and 1/3. Subtract 1/3 from ½ Multiply 3/4 x 2/3. Divide 2/3 by 3/5. Solve ½ x 1/5 ÷ 2/7.
3.4	Given 5 problems involving areas and volumes the student will solve 4 correctly.	3.4	1. What is the area of a bench top 20 inches wide and 72 inches long? 2. What is the cubic foot volume of a box 15" deep, 30" long, 36" wide. 3. What is the cubic inch volume of a cylinder 50" long with a diameter 6"? 4. What is the area of a piece of wood 6½ ' long and 3 1/3' wide? 5. How much more water would flow through a 4" diameter pipe versus one with 2" diameter?

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 4.0

ELECTRON THEORY

The learner will with 80% accuracy define terms associated with the electron theory and state the law of charges.

No.	Intermediate Performance Objectives	No.	Criterion Measures
4.1	With 80% accuracy the learner will identify the following terms: 1. Molecule 2. Atoms 3. Ionization 4. Proton 5. Neutron 6. Nucleus	4.1	Identify the following: 1. Molecule 2. Atom 3. Ionization 5. Proton 6. Neutron 7. Nucleus
4.2	With 80% accuracy draw a diagram of an atom and name it's parts.	4.2	Draw a simple atom and name it's parts.
4.3	With 80% accuracy the student will state the law of charges.	4.3	State the law of charges.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 5.0 — BASIC ELECTRICITY

The learner will with 80% accuracy define the reasons for electron movement, state cause and direction of current flow and will state the unit of measure for current and electrical pressure.

No.	Intermediate Performance Objectives	No.	Criterion Measures
5.1	The learner will with 80% accuracy define the following terms: 1. Electrical pressure 2. Conductor 3. Insulator 4. Electrical current	5.1	Identify the following: 1. Electrical pressure 2. Conductor 3. Insulator 4. Electrical current
5.2	The student will state with 80% accuracy the direction and cause of an electric current.	5.2	State what causes an electric current and tell which direction it will flow.
5.3	The student will with 80% accuracy name 5 insulators and 5 conductors.	5.3	Name 5 insulating materials and 5 conducting materials.
5.4	The student will identify the unit of measure for current and pressure with 80% accuracy.	5.4	Name the unit of measure for electrical pressure and current.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 6.0

ELECTRICAL CURRENT MOVEMENT

The student will with 80% accuracy demonstrate a knowledge of current carriers, resistance, current flow, units of measurement and Ohms Law by passing a teacher made test.

No.	Intermediate Performance Objectives	No.	Criterion Measures
6.1	The student will with 80% accuracy demonstrate a knowledge of current carriers.	6.1	1. Define the term Current Carriers 2. What is the term given to Atoms that have an abundance of electrons.
6.2	Student will with 80% accuracy define the term electrical pressure and demonstrate his ability to measure it.	6.2	1. What is the term used for electrical pressure. 2. What instrument is used to measure electrical pressure. 3. What effect does voltage have on current.
6.3	The student will with 80% accuracy define the term "resistance" and state what effect it has on electrical current.	6.3	Define the term "resistance" and state what effect it has on electric current.
6.4	With 80% accuracy state four factors that determine resistance.	6.4	State four factors that determine resistance.
6.5	With 80% accuracy define the term electric current.	6.5	Define electric current.
6.6	The student will define Ohms Law with 80% accuracy.	6.6	Define Ohms Law
6.7	The student will with 80% accuracy list the 3 letter symbol of Ohms Law and give the unit of measures for each.	6.7	List the 3 letter symbol of Ohms Law and give the unit of measure for each.
6.8	The learner will with 100% accuracy draw the Ohms Law circle and write the 3 law formulas.	6.8	Draw the Ohms Law. Circle and write the 3 law formulas.
6.9	Given 5 problems involving Ohms Law the student will solve 4 correctly.	6.9	Solve for E I=9 amps and R = 25 ohms

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 6.0

ELECTRICAL CURRENT MOVEMENT

No.	Intermediate Performance Objectives	No.	Criterion Measures
6.9	(Con't)	6.9	Solve for I E=110 volts and R = 11 ohms Solve for R E 220 volts and I = 440 amps Solve for P E 110 volts and I = 5 amps Solve for I P=11500 watts and E=230 volts

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 7.0

ELECTRIC CIRCUITRY

The student will, with 80% accuracy define the difference between, series, parallel, and series parallel circuits, be able to draw each and work math problems applicable to each.

No.	Intermediate Performance Objectives	No.	Criterion Measures
7.1	The student will, with 80% accuracy describe the characteristics of current and voltage in a series circuit.	7.1	Describe the characteristics of current and voltage in a series circuit.
7.2	The student will, with 80% accuracy describe the characteristics of current and voltage in a parallel circuit.	7.2	Describe the characteristics of current and voltage in a parallel circuit.
7.3	The student will draw a schematic diagram of a series - parallel circuit.	7.3	Draw a schematic of a series-parallel circuit.
7.4	The student will solve with 80% accuracy 3 series-parallel circuit resistance problems.	7.4	Solve to find the total resistance 1. R1 = 11 ohms R2 = 5 ohms R3 = 26 ohms 2. R1 = 20 ohms R2 = 5 ohms R3 = 41 ohms R4 = 26 ohms 3. R1 = 23 ohms R2 = 27 ohms R3 = 14 ohms R4 = 36 ohms

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCES REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 7.0

ELECTRIC CIRCUITRY

No.	Intermediate Performance Objectives	No.	Criterion Measures
7.5	Given 10 math problems on ohm's law the student will correctly solve 80% of them.	7.5	1. E = 100V, 1 = 2 amps, R = _____ 2. E = 50V, R = 1000 ohms, 1 = _____ 3. 1 = .5 amp, R = 50 ohms, E = _____ 4. E = 10V, 1 = .0001 amps, R = _____ 5. 1 = .05 amps, R = 1000 ohms, E = _____. 6. P= 10W, 1 = 2 amp, E = _____ 7. E = 100V, 1 = .5 amp, P = _____ 8. P = 500W, E = 250V, 1 = _____ 9. 1 = .01 amp,R = 100 ohm, E = _____ 10. P = 100W, 1 = 2 amp, R = _____

ACCENTUATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 8.0 METERS

The student will demonstrate, without causing damage, the use of meters by reading voltage, amperage, wattage, and resistance with 100 % accuracy.

No.	Intermediate Performance Objectives	No.	Criterion Measures
8.1	After a demonstration of the multimeter on the voltage scale the student will measure assigned voltage outlets with 100% accuracy.	8.1	Measure 3 assigned outlets and read correct voltage.
8.2	After a demonstration of the ohmmeter scale of the multimeter the student will measure with 100% accuracy the resistance in the start, and run windings of a refrigerator compressor.	8.2	Measure the resistance of the start winding and run winding of a refrigerator compressor.
8.3	After a demonstration on the use of the amprobe the student will measure with 100% accuracy the running amps, starting amps and locked rotor amps of a 1/3 H.P. compressor.	8.3	Measure the following amps on a 1/3 H.P. compressor Start_____ Run _____ Locked rotor_____
8.4	After demonstration of the wattmeter the student will measure with 100% accuracy the running watts of a 1/3 H.P. compressor.	8.4	Measure the running watts of a 1/3 H.P. compressor

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 9.0 — ELECTRIC MOTORS

Upon the completion of the study of electric motors the student will with 90% accuracy name the 5 types of single phase motors and describe each.

No.	Intermediate Performance Objectives	No.	Criterion Measures
9.1	The student will with 100% accuracy disassemble and reassemble a shaded pole motor.	9.1	Disassemble and reassemble a shaded pole motor, and give reason for it's name.
9.2	The student will with 100% accuracy disassemble and reassemble a split-phase motor.	9.2	Disassemble and reassemble a split-phase motor and give reason for it's name.
9.3	The student will with 100% accuracy disassemble and assemble a capacitor-start motor.	9.3	Disassemble and assemble a capacitor start motor and name its parts.
9.4	The student will with 100% accuracy disassemble and assemble a capacitor start, capacitor run motor.	9.4	Disassemble and assemble a capacitor start capacitor run motor and name its parts.
9.5	The student will with 100% accuracy disassemble and assemble a permanent split capacitor motor.	9.5	Disassemble and assemble a permanent split capacitor motor.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 10.0 ELECTRIC MOTORS (THREE PHASE)

After completion of the study of 3 phase motors the student will be able to identify 3 phase current, test a 3 phase motor and change the rotation of the motor.

No.	Intermediate Performance Objectives	No.	Criterion Measures
10.1	The student will be able to identify and describe 3 phase power with 100% accuracy.	10.1	Identify and describe 3 phase power.
10.2	The student will describe how 3 phase motors are connected to the power supply and what is used in starting them with 100% accuracy.	10.2	Show how a 3 phase motor is connected to the power supply and what is used for starting.
10.3	The student will with 100% accuracy change the rotation of a 3 phase motor.	10.3	Change the rotation of a 3 phase motor

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 11.0

RELAYS AND CAPACITORS

Upon completion of the section on relays and capacitors the student will with 90% accuracy name the types of relays and capacitors and describe the operation of each.

No.	Intermediate Performance Objectives	No.	Criterion Measures
11.1	The student will with 90% accuracy name the 3 types of relays and describe their operation.	11.1	Name 3 types of relays and describe their operation.
11.2	The student will with 100% accuracy correctly wire the 3 types of relays.	11.2	Wire correctly the 3 types of relays.
11.3	The student will identify, test and wire a starting capacitor with 100% accuracy.	11.3	Identify, test and wire correctly a starting capacitor.
11.4	The student will with 100% accuracy, identify, test and properly wire a running capacitor.	11.4	Identify, test and properly wire a running capacitor.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 12.0

CIRCUIT PROTECTION DEVICES

The student will with 90% accuracy pass a written test on the purpose, sizing, and different types of circuit protection devices.

No.	Intermediate Performance Objectives	No.	Criterion Measures
12.1	The student will with 90% accuracy name and describe the different types of fuses.	12.1	Name and describe the types of fuses.
12.2	The student will with 90% accuracy describe the construction and uses of a circuit breaker.	12.2	Describe the construction and uses of a circuit breaker.
12.3	The student will with 100% accuracy identify and describe the use of a thermal overload device.	12.3	Identify and describe the use of a thermal overload device.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 13.0

WATER HEATERS

The student will with 100% accuracy be able to describe the proper hook up of water and electricity and be able to trouble-shoot the electrical components.

No.	Intermediate Performance Objectives	No.	Criterion Measures
13.1	The student will with 100% accuracy be able to describe the proper installation procedure of a water heater.	13.1	Describe the proper installation procedures for a water heater including uncrating, leveling, water and electric connections.
13.2	The student will with 100% accuracy describe the types of thermostats, operation and how to adjust and check.	13.2	Describe types of thermostats, their operations and demonstrate method of checking them.
13.3	The student will with 100% accuracy describe two types of water heater elements, their construction and how to check them.	13.3	Describe two types of water heater elements, describe their construction, and demonstrate the method of checking them.
13.4	The student will with 100% accuracy demonstrate his ability to locate a malfunction in a thermostat, element, and wiring.	13.4	The student will locate and repair a defective thermostat, element and wiring on an electric water heater.
13.5	The student will properly diagnose 3 of 4 of the following customer complaints. 1. No hot water 2. Water too hot. 3. Not enough hot water 4. Heater blows fuses	13.5	Criteria contained in objective.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE
OBJECTIVE NO. 14.0 ELECTRIC RANGES

The student will with 90% accuracy be able to install, level and test the electrical components of an electric range.

No.	Intermediate Performance Objectives	No.	Criterion Measures
14.1	The student will with 90% accuracy uncrate, level, install pigtail, and check out an electric range.	14.1	Uncrate, level, install pigtail and check an electric range for proper operation.
14.2	The student will with 100% accuracy describe the types, function and electrical hook up of the surface unit switches.	14.2	Describe the types, function, and electrical hook-up of the surface unit switches.
14.3	The student will be able with 100% accuracy to name the types, construction and electrical hook-up of the surface units.	14.3	Name the types, construction, and electrical hook-up of the surface units.
14.4	The student will with 100% accuracy be able to test the oven thermostat and correct any malfunction.	14.4	Test the oven thermostat for proper temperature or malfunction.
14.5	The student will be able with 90% accuracy to diagnose and correct any electrical malfunction of the electrical range.	14.5	Trouble shoot and correct any malfunction in an electric range. 1. Defective switch 2. Defective surface unit 3. Defective oven thermostat
14.6	The student will with 90% accuracy be able to replace and adjust mechanical parts such as tops, drawer fronts, panels and oven doors.	14.6	Replace and adjust an oven door.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 15.0 DISHWASHERS

The student will be able to uncrate, install, and describe the operation of an electric dishwasher with 90% accuracy.

No.	Intermediate Performance Objectives	No.	Criterion Measures
15.1	The student will be able with 90% accuracy to describe or demonstrate the proper procedure for uncrating and installing an electric dishwasher	15.1	Describe the proper step by step procedure for uncrating and installing an electric dishwasher.
15.2	The student will with 100% accuracy describe the step by step cycle of operation of an electric dishwasher	15.2	Describe the step by step cycle of operation of an electric dishwasher.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 16.0

DISHWASHER TROUBLESHOOTING

The student will with 100% accuracy name the electrical parts of an electric dishwasher and demonstrate the proper procedure for trouble-shooting.

No.	Intermediate Performance Objectives	No.	Criterion Measures
16.1	The student will with 100% accuracy trace all timer operated circuits and list the proper timer contact for each.	16.1	Trace all timer operated circuits and list the timer contact of each.
16.2	The student will with 100% accuracy diagnose a malfunction in motor circuit and correct.	16.2	Trouble-shoot and repair the motor circuit.
16.3	The student will with 100% accuracy diagnose and repair the water fill cycle.	16.3	Trouble-shoot and repair the water fill cycle.
16.4	The student will with 100% accuracy diagnose and repair the water pump.	16.4	Trouble-shoot and repair the water pump.
16.5	The student will with 100% accuracy describe the replacement and adjustments of of all cabinet parts.	16.5	Describe the proper method of replacing and adjusting the door panel.
16.6	The student will diagnose properly and repair 3 of 4 of the following customer complaints: 1. Dishes are not clean. 2. Dishes aren't dry. 3. Leaking. 4. Doesn't run.	16.6	Criteria contained in objective.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 17.0

AUTOMATIC WASHERS

The student will with 100% accuracy be able to uncrate, install, and demonstrate an automatic washer.

No.	Intermediate Performance Objectives	No.	Criterion Measures
17.1	The student will with 100% accuracy uncrate, install and level an automatic washer.	17.1	Uncrate, install and level an automatic washer.
17.2	The student will be able with 100% accuracy to demonstrate and describe the cycle of operation.	17.2	Describe step by step the cycle of operation.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 18.0

AUTOMATIC WASHER TIMERS

The student will be able to with 100% accuracy check all timer circuits and list the electric contact for each component.

No.	Intermediate Performance Objectives	No.	Criterion Measures
18.1	The student will with 100% accuracy describe what happens in the cycle at each pulse of the timer.	18.1	Describe what happens at each pulse of the timer.
18.2	The student will with 100% accuracy diagnose and replace any defective timer part such as motor or escapement.	18.2	Diagnose and replace a timer escapement and timer motor.
18.3	The student will with 100% accuracy check all timer contacts and adjust if necessary.	18.3	Check clearance on timer contacts and adjust to manufacturers specification.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 19.0

AUTOMATIC WASHER (DRIVE SYSTEM)

The student will with 100% accuracy diagnose, repair and adjust all parts of the drive system (motor, belts, pulleys).

No.	Intermediate Performance Objectives	No.	Criterion Measures
19.1	The student will with 100% accuracy trace out motor circuit, remove and replace motor.	19.1	Trace out motor circuit, remove and replace motor.
19.2	The student will with 100% accuracy remove, replace and realign all pulleys in the drive system.	19.2	Remove, replace and realign all pulley's in the drive system.
19.3	The student will with 100% accuracy remove, replace and adjust all drive belts.	19.3	Remove, replace and adjust all drive belts.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCES REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 20.0

AUTOMATIC WASHER (WATER FILL & PUMP CYCLE)

The student will with 100% accuracy explain the water fill and pump out cycle, diagnose and replace any part needed.

No.	Intermediate Performance Objectives	No.	Criterion Measures
20.1	The student will with 100% accuracy trace out the electric circuit to the hot and cold water solanoid and repair if needed.	20.1	Trace the hot and cold water solenoid circuit and repair if needed.
20.2	The student will with 100% accuracy disassemble the mix and fill valve, name all parts and their function and reassemble.	20.2	Disassemble the mix and fill valve, name all parts and their function and reassemble.
20.3	The student will with 100% accuracy remove, rebuild and replace the water pump.	20.3	Remove, rebuild and replace the water pump.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 21.0

AUTOMATIC WASHER (TRANSMISSIONS)

The student will with 100% accuracy remove, tear down, completely rebuild, and replace an automatic washer transmission.

No.	Intermediate Performance Objectives	No.	Criterion Measures
21.1	The student will with 100% accuracy remove the transmission from a top loading washer and describe its operation.	21.1	Remove the transmission on a top loading washer and discribe it's operating principle.
21.2	The student will with 100% accuracy remove and replace the clutch spring in the transmission.	21.2	Remove and replace the clutch spring.
21.3	The student will with 100% accuracy disassemble the transmission, inspect parts for wear, replace if needed, reassemble.	21.3	Disassemble the transmission, inspect parts, replace as needed and reassemble.
21.4	The student will with 100% accuracy drain the transmission, replace the oil and reinstall in machine.	21.4	Drain the oil and replace with proper viscosity and quanity reinstall transmission in machine.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 22.0

TROUBLE-SHOOTING (AUTOMATIC WASHER)

The student will with 90% accuracy diagnose and repair problems with automatic washers.

No.	Intermediate Performance Objectives	No.	Criterion Measu
22.1	The student will diagnose and repair 3 or 4 of the following customer complaints on the electrical parts of an automatic washer. 1. Motor doesn't run. 2. Timer doesn't advance. 3. No water comes in tub. 4. Clothes won't spin.	22.1	Criteria contained in objective.
22.2	The student will with 90% accuracy diagnose and repair 3 of 4 of the following customer complaints on the mechanical parts of an automatic washer. 1. Tub won't turn. 2. Tub won't spin. 3. Leaks 4. Excessive vibration	22.2	Criteria contained in objective.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 23.0 DRYERS

The student will with 100% accuracy uncrate, install and demonstrate an automatic electric clothes dryer.

No.	Intermediate Performance Objectives	No.	Criterion Measures
23.1	The student will with 100% accuracy uncrate, remove hold down bolts, and packing from an electric clothes dryer.	23.1	Uncrate, remove hold down bolts from an electric clothes dryer.
23.2	The student will with 100% accuracy install pigtail, lint filter, level and install an electric clothes dryer.	23.2	Install pigtail, lint filter, level and install an electric clothes dryer.
23.4	The student will with 100% accuracy check the cycle of operation and demonstrate the operation of an electric clothes dryer to the customer.	23.3	Check the operation cycle of an electric clothes dryer and demonstrate to the customer.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 24.0

DRYERS (ELECTRICAL COMPONENTS)

The student will with 100% accuracy trace all electric circuits, diagnose malfunction and repair or replace electrical parts as needed on an electric clothes dryer.

No.	Intermediate Performance Objectives	No.	Criterion Measures
24.1	The student will with 100% accuracy trace the motor circuit, test the motor for malfunction and replace as necessary.	24.1	Check the motor circuit, test the motor for malfunction and replace if necessary to meet manufacturers specifications.
24.2	The student will with 100% accuracy trace the heater circuit, test the heater coil and replace or rewire if necessary.	24.2	Trace the heater circuit, test the heater coil, rewire or replace as necessary to meet manufacturer's specs.
24.3	The student will with 100% accuracy completely disassemble and reassemble an electric clothes dryer.	24.3	Completely disassemble and reassemble an electric clothes dryer.

ACCREDITATION NUMBER 9023

COURSE TITLE: APPLIANCE REPAIR (BASIC)

TERMINAL PERFORMANCE OBJECTIVE NO. 25.0

TROUBLE-SHOOTING - LAUNDRY EQUIPMENT

The student will with 90% accuracy be able to diagnose and repair electrical and mechanical problems on automatic washers and electric clothes dryers.

No.	Intermediate Performance Objectives	No.	Criterion Measures
25.1	The student will with 90% accuracy diagnose and repair an automatic washer with the following customer complaints: 1. Motor won't run. 2. No water comes in machine. 3. Clothes won't spin. 4. Machine vibrates excessively.	25.1	Criteria contained in objective.
25.2	The student will with 90% accuracy diagnose and repair an electric clothes dryer with the following customer complaints. 1. Tub won't turn. 2. Motor doesn't run. 3. Clothes not dry. 4. Door won't close.	25.2	Criteria contained in objective.